

WHAT IS CLAIMED IS:

1. An automatic transmission, comprising:

a first planetary gear set;

a second planetary gear set;

a first clutch;

a second clutch;

a first brake;

a second brake;

a third brake;

a non-rotatable portion;

an input portion for inputting rotations; and

an output portion for outputting rotations transmitted from the input portion,

wherein

a planetary gear of the first planetary gear set and a planetary gear of the second planetary gear set are integrally coupled with each other such that the planetary gears rotate about a common axis;

a carrier of the first planetary gear set and a carrier of the second planetary gear set are integrally coupled with each other; and

a sun gear and a ring gear of the first planetary gear set, a sun gear and a ring gear of the second planetary gear set, and the coupled carriers of the first and second planetary gear sets form a first rotational element, a second rotational element, a third rotational element, a fourth rotational element, and a fifth rotational element that are indicated, sequentially from an end toward another end, in an alignment graph for indicating rotation speeds of rotational elements by straight lines, and wherein

the first rotational element is selectively connectable to the non-rotatable portion via the third brake so that rotation of the first rotational element is stopped by engaging the third brake;

the second rotational element is selectively connectable to the non-rotatable portion via the second brake so that rotation of the second rotational element is stopped by engaging the second brake;

the third rotational element is selectively connectable to the input portion via the second clutch and is selectively connectable to the non-rotatable portion via the first brake so that rotation of the third rotational element is stopped by engaging the first brake;

the fourth rotational element is coupled with the output portion; and
 the fifth rotational element is selectively connectable to the input portion via the first clutch, and wherein

engagement of the first clutch and the first brake establishes a first gear speed having a largest transmission gear ratio;

engagement of the first clutch and the second brake establishes a second gear speed having a transmission gear ratio smaller than the transmission gear ratio of the first gear speed;

engagement of the first clutch and the third brake establishes a third gear speed having a transmission gear ratio smaller than the transmission gear ratio of the second gear speed;

engagement of the first clutch and the second clutch establishes a fourth gear speed having a transmission gear ratio smaller than the transmission gear ratio of the third gear speed; and

engagement of the second clutch and the third brake establishes a fifth gear speed having a transmission gear ratio smaller than the transmission gear ratio of the fourth gear speed.

2. The automatic transmission according to claim 1, wherein

the first planetary gear set is of a single-pinion type;

the second planetary gear set is of a double-pinion type;

the planetary gear of the first planetary gear set and an outer planetary gear of the second planetary gear set are integrally coupled with each other;

the first rotational element is formed by the sun gear of the first planetary gear set;

the second rotational element is formed by the carrier of the first planetary gear set and the carrier of the second planetary gear set;

the third rotational element is formed by the ring gear of the second planetary gear set;

the fourth rotational element is formed by the ring gear of the first planetary gear set; and

the fifth rotational element is formed by the sun gear of the second planetary gear set.

3. The automatic transmission according to claim 1, wherein

- the first planetary gear set is of a single-pinion type;
- the second planetary gear set is of a double-pinion type;
- the planetary gear of the first planetary gear set and an inner planetary gear of the second planetary gear set are integrally coupled with each other;
- the first rotational element is formed by the ring gear of the first planetary gear set;
- the second rotational element is formed by the carrier of the first planetary gear set and the carrier of the second planetary gear set;
- the third rotational element is formed by the ring gear of the second planetary gear set;
- the fourth rotational element is formed by the sun gear of the first planetary gear set; and
- the fifth rotational element is formed by the sun gear of the second planetary gear set.

4. An automatic transmission, comprising:

- a first planetary gear set;
- a second planetary gear set;
- a first clutch;
- a second clutch;
- a third clutch;
- a first brake;
- a second brake;
- a third brake;
- a non-rotatable portion;
- an input portion for inputting rotations; and
- an output portion for outputting rotations transmitted from the input portion,

wherein

- a planetary gear of the first planetary gear set and a planetary gear of the second planetary gear set are integrally coupled with each other such that the planetary gears rotate about a common axis;
- a carrier of the first planetary gear set and a carrier of the second planetary gear set are integrally coupled with each other; and

a sun gear and a ring gear of the first planetary gear set, a sun gear and a ring gear of the second planetary gear set, and the coupled carriers of the first and second planetary gear sets form a first rotational element, a second rotational element, a third rotational element, a fourth rotational element, and a fifth rotational element that are indicated, sequentially from an end toward another end, in an alignment graph for indicating rotation speeds of rotational elements by straight lines, and wherein

the first rotational element is selectively connectable to the non-rotatable portion via the third brake so that rotation of the first rotational element is stopped by engaging the third brake;

the second rotational element is selectively connectable to the input portion via the third clutch and is selectively connectable to the non-rotatable portion via the second brake so that rotation of the second rotational element is stopped by engaging the second brake;

the third rotational element is selectively connectable to the input portion via the second clutch and is selectively connectable to the non-rotatable portion via the first brake so that rotation of the third rotational element is stopped by engaging the first brake;

the fourth rotational element is coupled with the output portion; and

the fifth rotational element is selectively connectable to the input portion via the first clutch, and wherein

engagement of the first clutch and the first brake establishes a first gear speed having a largest transmission gear ratio;

engagement of the first clutch and the second brake establishes a second gear speed having a transmission gear ratio smaller than the transmission gear ratio of the first gear speed;

engagement of the first clutch and the third brake establishes a third gear speed having a transmission gear ratio smaller than the transmission gear ratio of the second gear speed;

engagement of selected two of the first clutch, the second clutch, and the third clutch establishes a fourth gear speed having a transmission gear ratio smaller than the transmission gear ratio of the third gear speed; and

engagement of the second clutch and the third brake establishes a fifth gear speed having a transmission gear ratio smaller than the transmission gear ratio of the fourth gear speed;

engagement of the third clutch and the third brake establishes a sixth gear speed having a transmission gear ratio smaller than the transmission gear ratio of the fifth gear speed; and

engagement of the second clutch and the second brake establishes a seventh gear speed having a transmission gear ratio smaller than the transmission gear ratio of the sixth gear speed.

5. The automatic transmission according to claim 4, wherein
 - the first planetary gear set is of a single-pinion type;
 - the second planetary gear set is of a double-pinion type;
 - the planetary gear of the first planetary gear set and an outer planetary gear of the second planetary gear set are integrally coupled with each other;
 - the first rotational element is formed by the sun gear of the first planetary gear set;
 - the second rotational element is formed by the carrier of the first planetary gear set and the carrier of the second planetary gear set;
 - the third rotational element is formed by the ring gear of the second planetary gear set;
 - the fourth rotational element is formed by the ring gear of the first planetary gear set; and
 - the fifth rotational element is formed by the sun gear of the second planetary gear set.

6. An automatic transmission, comprising:

- a first planetary gear set;
- a second planetary gear set;
- a first clutch;
- a second clutch;
- a third clutch;
- a first brake;
- a second brake;
- a third brake;
- a non-rotatable portion;
- an input portion for inputting rotations; and

an output portion for outputting rotations transmitted from the input portion, wherein

a planetary gear of the first planetary gear set and a planetary gear of the second planetary gear set are integrally coupled with each other such that the planetary gears rotate about a common axis;

a carrier of the first planetary gear set and a carrier of the second planetary gear set are integrally coupled with each other; and

a sun gear and a ring gear of the first planetary gear set, a sun gear and a ring gear of the second planetary gear set, and the coupled carriers of the first and second planetary gear sets form a first rotational element, a second rotational element, a third rotational element, a fourth rotational element, and a fifth rotational element that are indicated, sequentially from an end toward another end, in an alignment graph for indicating rotation speeds of rotational elements by straight lines, and wherein

the first rotational element is selectively connectable to the non-rotatable portion via the third brake so that rotation of the first rotational element is stopped by engaging the third brake;

the second rotational element is selectively connectable to the input portion via the third clutch and is selectively connectable to the non-rotatable portion via the second brake so that rotation of the second rotational element is stopped by engaging the second brake;

the third rotational element is selectively connectable to the input portion via the second clutch and is selectively connectable to the non-rotatable portion via the first brake so that rotation of the third rotational element is stopped by engaging the first brake;

the fourth rotational element is coupled with the output portion; and

the fifth rotational element is selectively connectable to the input portion via the first clutch, and wherein

engagement of the first clutch and the first brake establishes a first gear speed having a largest transmission gear ratio;

engagement of the first clutch and the second brake establishes a second gear speed having a transmission gear ratio smaller than the transmission gear ratio of the first gear speed;

engagement of the first clutch and the third brake establishes a third gear speed having a transmission gear ratio smaller than the transmission gear ratio of the second gear speed;

engagement of selected two of the first clutch, the second clutch, and the third clutch establishes a fourth gear speed having a transmission gear ratio smaller than the transmission gear ratio of the third gear speed;

engagement of the second clutch and the third brake establishes a fifth gear speed having a transmission gear ratio smaller than the transmission gear ratio of the fourth gear speed;

engagement of the second clutch and the second brake establishes a sixth gear speed having a transmission gear ratio smaller than the transmission gear ratio of the fifth gear speed; and

engagement of the third clutch and the third brake establishes a seventh gear speed having a transmission gear ratio smaller than the transmission gear ratio of the sixth gear speed.

7. The automatic transmission according to claim 6, wherein

the first planetary gear set is of a single-pinion type;

the second planetary gear set is of a double-pinion type;

the planetary gear of the first planetary gear set and an inner planetary gear of the second planetary gear set are integrally coupled with each other;

the first rotational element is formed by the ring gear of the first planetary gear set;

the second rotational element is formed by the carrier of the first planetary gear set and the carrier of the second planetary gear set;

the third rotational element is formed by the ring gear of the second planetary gear set;

the fourth rotational element is formed by the sun gear of the first planetary gear set; and

the fifth rotational element is formed by the sun gear of the second planetary gear set.